Title: Interprocess Communication Within Operating System
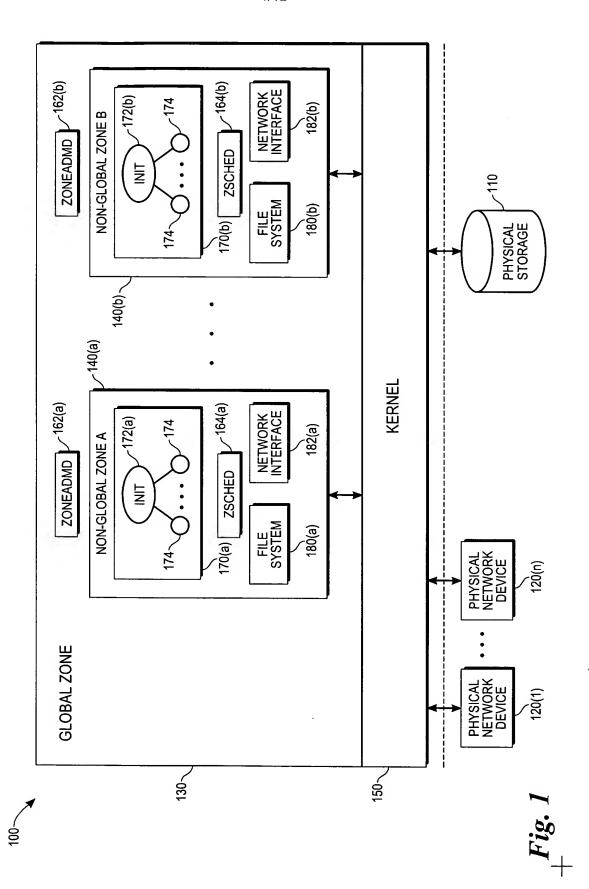Partitions
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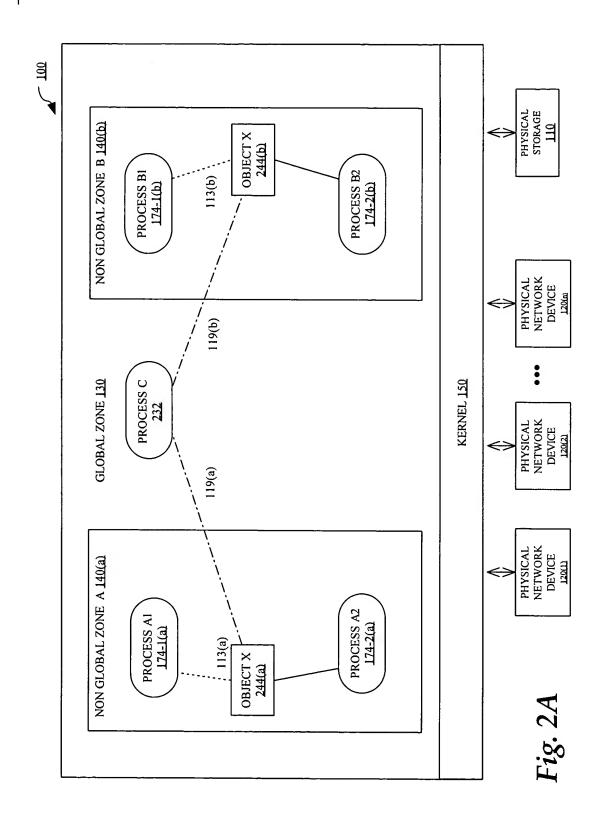
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Fig. 1

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Fig. 2A

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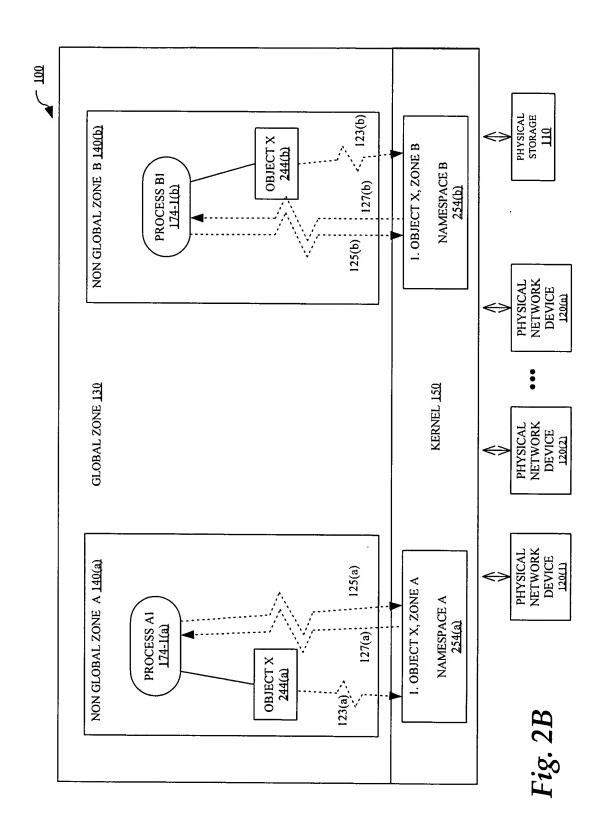Inventor: Andrew G. Tucker
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Fig. 2B

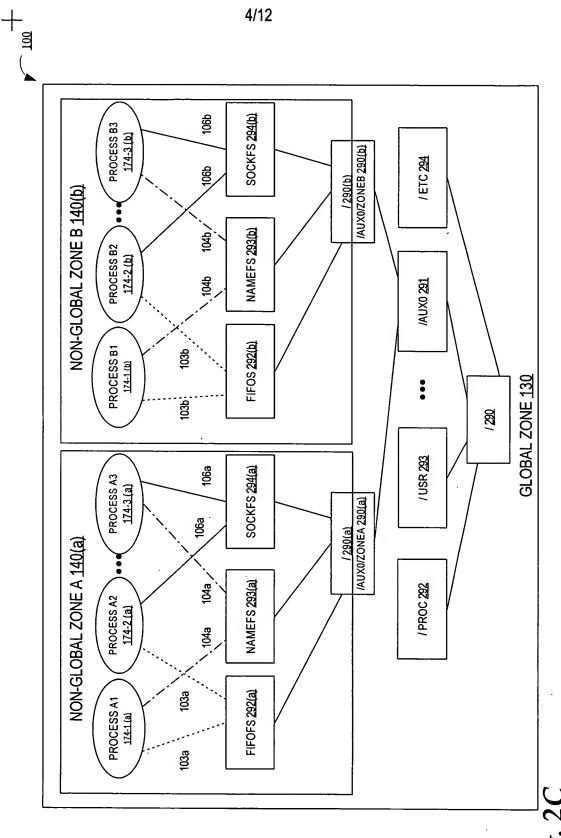Title: Interprocess Communication Within Operating System
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Fig. 2C

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312 ESTABLISH NON-GLOBAL ZONE(S) HAVING UNIQUE IDENTIFIERS TO ISOLATE PROCESSES
(FIG. 3C)

314 RESPONSIVE TO A FIRST REQUEST, CREATE A COMMUNICATIONS OBJECT WITH A ZONE IDENTIFIER CORRESPONDING TO THE NON-GLOBAL ZONE 140 OF A PROCESS REQUESTING CREATION OF THE COMMUNICATION OBJECT
(FIG. 3D)

316 RESPONSIVE TO A SECOND REQUEST, INITIATING A COMMUNICATIONS USING THE COMMUNICATIONS OBJECT FOR A REQUESTING PROCESS DETERMINED TO BE ASSOCIATED WITH THE SAME NON-GLOBAL ZONE ASSOCIATED WITH THE COMMUNICATIONS OBJECT
(FIG. 3E, 3I)

RETURN

Fig. 3A

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322 ESTABLISH NON-GLOBAL ZONE(S) TO ISOLATE PROCESSES, EACH NON-GLOBAL ZONE HAVING A FILE SYSTEM WITH LOCATIONS TO MANAGE COMMUNICATIONS OBJECTS
(FIG. 3F)

324 CREATE A COMMUNICATIONS OBJECT IN A FILE SYSTEM AT A FILE SYSTEM LOCATION CORRESPONDING TO A COMMUNICATIONS TRANSPORT MECHANISM
(FIG. 3G)

326 RESPONSIVE TO A REQUEST, INITIATING A COMMUNICATIONS USING THE COMMUNICATIONS OBJECT FOR A REQUESTING PROCESS DETERMINED TO BE ASSOCIATED WITH THE SAME NON-GLOBAL ZONE ASSOCIATED WITH THE COMMUNICATIONS OBJECT
(FIG. 3H, FIG. 3I)

RETURN

Fig. 3B

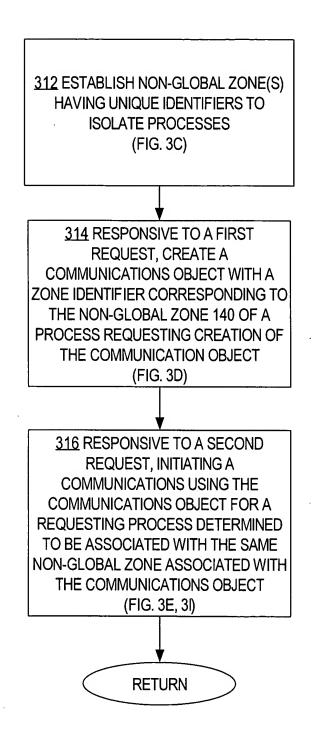Title: Interprocess Communication Within Operating System
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Date: January 27, 2004   Express Mail No. EV323351547US
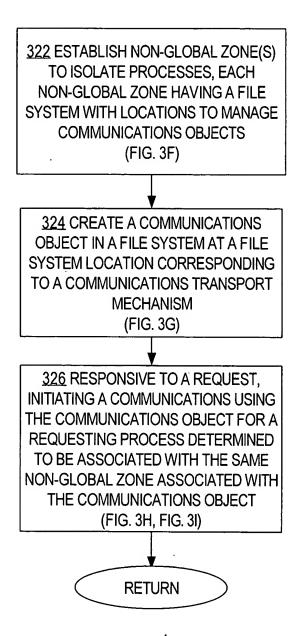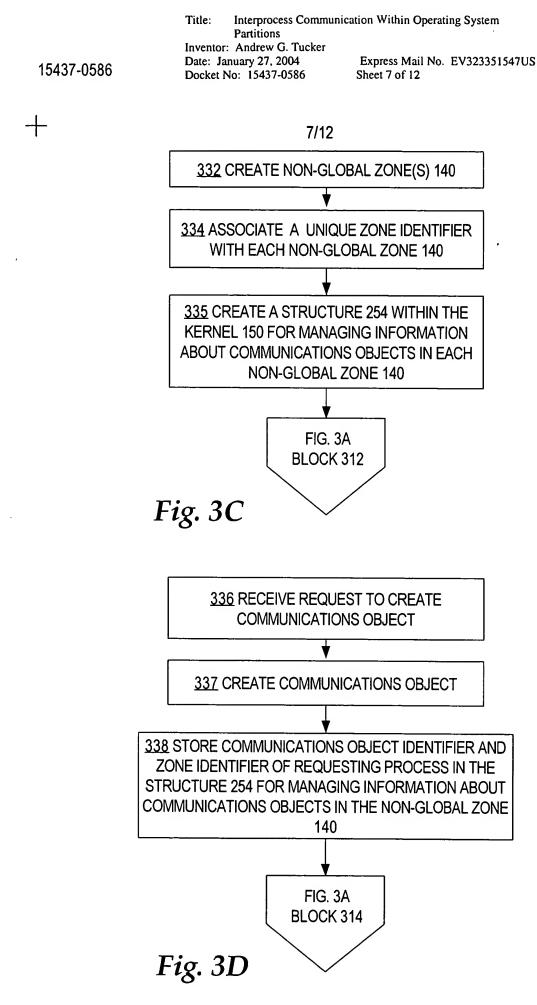Docket No: 15437-0586   Sheet 7 of 12

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332 CREATE NON-GLOBAL ZONE(S) 140

334 ASSOCIATE A UNIQUE ZONE IDENTIFIER WITH EACH NON-GLOBAL ZONE 140

335 CREATE A STRUCTURE 254 WITHIN THE KERNEL 150 FOR MANAGING INFORMATION ABOUT COMMUNICATIONS OBJECTS IN EACH NON-GLOBAL ZONE 140

FIG. 3A
BLOCK 312

Fig. 3C

336 RECEIVE REQUEST TO CREATE COMMUNICATIONS OBJECT

337 CREATE COMMUNICATIONS OBJECT

338 STORE COMMUNICATIONS OBJECT IDENTIFIER AND ZONE IDENTIFIER OF REQUESTING PROCESS IN THE STRUCTURE 254 FOR MANAGING INFORMATION ABOUT COMMUNICATIONS OBJECTS IN THE NON-GLOBAL ZONE 140

FIG. 3A
BLOCK 314

Fig. 3D

342 RECEIVE A REQUEST FROM A PROCESS 174-1 TO INITIATE AN INTERPROCESS COMMUNICATION

344 DETERMINE BASED UPON A ZONE IDENTIFIER OF THE REQUESTING PROCESS 174-1, THE REQUEST, AND THE DATA STRUCTURE 254, WHETHER THE REQUESTING PROCESS 174-1 IS AUTHORIZED TO USE THE REQUESTED COMMUNICATIONS

NO ◄——— **346** ZONE ID MATCHES? ———► YES

348 DENY THE REQUEST BECAUSE PROCESS 174-1 IS NOT ASSOCIATED WITH NON-GLOBAL ZONE 140

352 PERMIT THE REQUEST FROM PROCESS 174-1 AND GRANT ACCESS TO OBJECT 244 OF NON-GLOBAL ZONE 140

FIG. 3A BLOCK 316

FIG. 3A BLOCK 316

Fig. 3E

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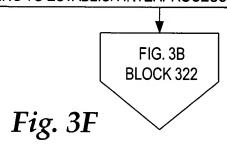Docket No: 15437-0586   Sheet 9 of 12

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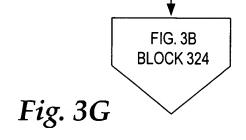9/12

356 ESTABLISH NON-GLOBAL ZONE(S) 140

357 MOUNT A FILE SYSTEM FOR EACH NON-GLOBAL ZONE 140
TO THE FILE SYSTEM OF THE OPERATING SYSTEM
ENVIRONMENT 100

358 ESTABLISH FILE SYSTEM LOCATIONS IN THE FILE SYSTEM
OF THE NON-GLOBAL ZONE 140 TO CREATE RENDEZVOUS
POINTS FOR PROCESSES IN THE NON-GLOBAL ZONE 140
SEEKING TO ESTABLISH INTERPROCESS COMMUNICATIONS

FIG. 3B
BLOCK 322

Fig. 3F

362 ESTABLISH COMMUNICATIONS OBJECTS IN
THE FILE SYSTEM LOCATIONS TO SERVE AS
RENDEZVOUS POINTS

364 ESTABLISH ACCESS PERMISSIONS FOR
ACCESSING THE FILE SYSTEM LOCATIONS

FIG. 3B
BLOCK 324

Fig. 3G
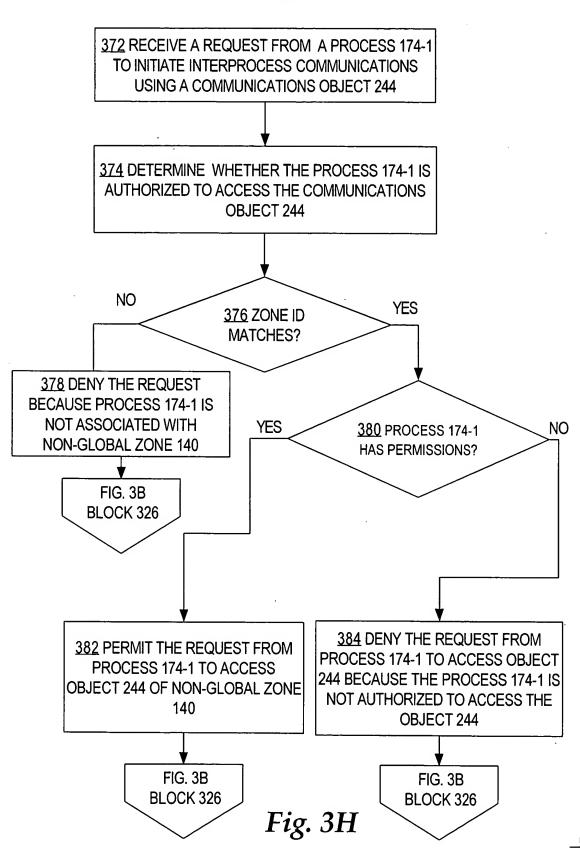
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372 RECEIVE A REQUEST FROM A PROCESS 174-1 TO INITIATE INTERPROCESS COMMUNICATIONS USING A COMMUNICATIONS OBJECT 244

374 DETERMINE WHETHER THE PROCESS 174-1 IS AUTHORIZED TO ACCESS THE COMMUNICATIONS OBJECT 244

376 ZONE ID MATCHES?

NO

YES

378 DENY THE REQUEST BECAUSE PROCESS 174-1 IS NOT ASSOCIATED WITH NON-GLOBAL ZONE 140

FIG. 3B BLOCK 326

380 PROCESS 174-1 HAS PERMISSIONS?

YES

NO

382 PERMIT THE REQUEST FROM PROCESS 174-1 TO ACCESS OBJECT 244 OF NON-GLOBAL ZONE 140

384 DENY THE REQUEST FROM PROCESS 174-1 TO ACCESS OBJECT 244 BECAUSE THE PROCESS 174-1 IS NOT AUTHORIZED TO ACCESS THE OBJECT 244

FIG. 3B BLOCK 326

FIG. 3B BLOCK 326

Fig. 3H

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386 RECEIVE A REQUEST FROM A PROCESS 174-1(A) ASSOCIATED WITH A NON-GLOBAL ZONE A 140(A) TO INITIATE INTERPROCESS COMMUNICATIONS WITH A PROCESS 174-1(B) ASSOCIATED WITH NON-GLOBAL ZONE B 140(B)

388 DETERMINE BASED UPON A ZONE IDENTIFIER AND CREDENTIALS OF PROCESS 174-1(A) WHETHER THE REQUESTED COMMUNICATIONS WITH A PROCESS 174-1(B) OF THE NON-GLOBAL ZONE 140(B) IS AUTHORIZED

NO ← 390 AUTHORIZED? → YES

392 DENY THE REQUEST

394 PERMIT THE REQUEST AND ESTABLISH AN INTER-ZONE INTER-PROCESS COMMUNICATIONS PATH

FIG. 3A BLOCK
316 OR
FIG. 3B
BLOCK 326

FIG. 3A BLOCK
316 OR
FIG. 3B
BLOCK 326

Fig. 3I

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Fig. 4